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ON THE LARVÆ OF SOME NEMATOID AND OTHER SAW-FLIES FROM THE NORTHERN ATLANTIC STATES.

BY HARRISON G. DYAR.

The larvæ of our saw-flies have been much neglected, and the majority of those here described have not been referred to previously in literature, though they were collected at random. They include only those that I have succeeded in bringing to imago. Mr. C. L. Marlatt, of the Department of Agriculture, has kindly determined a number of them.

Pristiphora tibialis Norton.

Larva.—Head whitish, scarcely shining, eye black, mouth brown; a green tint by transparency; width 1.5 mm. Body smooth, not shining, faintly 4-annulated, translucent leaf-green, the pulsating edges of the dorsal vessel forming a geminate white dorsal line, filled in with the darker green blood, the anal end usually touched with crimson; segmental incisures a little folded, forming transverse whitish bands when the segments are retracted; tracheal line evident; thoracic feet clear, moderately spreading, abdominal ones small, present on joints 6-11 and 13.

Last stage.—As before, but the head is shining, with brown dots; body also more shiny; width of head the same as before; the larvæ form brown cocoons in the earth.

Found on the white birch (*Betula papyrifera*), sometimes hiding under the bark, or on the leaves at Keene Valley, New York; also on willow and yellow birch at Jefferson, N. H.

Nematus similaris Norton.

Egg.—The eggs are laid in incisions, solitary under the lower epidermis, the cuts forming semi-circular incisions .8 mm. in diameter.

First stage.—Eating a hole in the leaf; lashing the body when disturbed. Head entirely blackish, almost black, mouth pale, width .4 mm. Thoracic feet large, black except at the joints. Body annulate, shining, translucent whitish; alimentary canal green; a pair of button-like, black anal tubercles; no suranal plate visible; feet on joints 6-11 small, concolorous; on joint 13 rudimentary.

Second stage.—Head pale, shaded with brown, most distinctly in a vertical median and lateral stripe; eye and mouth dark; width .6 mm. Thoracic feet watery, black at base and tip. Body more greenish than before, as the alimentary canal shows plainer; traces of blackish subventral tubercles.

Third stage.—As in the next stage, but the markings on the head are more diffuse and brownish; width .9 mm. Thoracic feet black tipped.

Fourth stage.—Head round, wider than high, clypeus large; width. 1.2 mm. Pale greenish, eye black; a narrow blackish line along median suture and right across the clypeus above; a lateral brownish one above and behind the eye. Thoracic feet moderate, abdominal small, on joints 6–11, 13; segments rather obscurely 4-annulate, shining between the annulets, greenish; general appearance not shining, translucent yellowish green, alimentary canal darker, but not contrasting; no marks nor tubercles.

Fifth stage.—As before; width of head 1.5 mm.; anal processes short, cylindric-truncate, brown tipped.

Sixth stage.—Much as before, but the two anterior annulets are obscurely watery; width of head the same; the larvæ enter the earth to form their cocoons.

Food-plant.—Locust (*Robinia pseudacacia*). The larvæ are solitary and eat holes in the leaves or sit on the edge of a leaf, as depicted in the figures copied from Comstock in the Fifth Report U. S. Ent. Com., p. 369.

Nematus mendicus Walsh.

Two species with green females were sent to Mr. Marlatt and determined as *mendicus*. The larvæ are not inquilines, but Mr. Marlatt states that Walsh's conclusions are not improbably founded upon error. Therefore, I will describe the first larva under this name, as it feeds on willow. The other is different, the fly also is considerably larger than *mendicus*, with only very slight brownish black marks on vertex of head and on thorax. I distinguish it below as *N. pinguidorsum*.

Egg.—Laid anywhere on the leaf in semicircular saw-cuts just under the upper epidermis; cuts 1.5 mm. in diameter.

First stage.—Head blackish testaceous, shining, eye and mouth black; higher than the body; width .3 mm Body indistinctly 4-annulate, not very shining, greenish. Thoracic feet and anal prongs blackish; abdominal feet on joints 6–11 and 13.

Second stage.—Head dull testaceous, a blackish longitudinal line at the vertex, one upward from each ocellus; eye black, mouth brown; width .55 mm. Body dull greenish, thoracic feet concolorous; a faint blackish tinge above spiracles and a little on subventral ridge on joints 2–4, pale along dorsal line; posterior portion of the body curved under so as to touch the venter; anal prongs blackish.

Third stage.—Head rounded, flattened before, pale green. faintly brownish tinged; a black longitudinal line over the vertex, reaching top of clypeus: a lateral transverse line over ocellus, not quite reaching vertex; mouth brown; width .9 mm. Body soft, leaf green, a faint blackish dorsal and substigmatal shade line; venter a shade paler. Feet small, green; anal prongs blackish. Body scarcely annulate, not shining; tracheæ showing as a white line.

Fourth stage.—Head clear green, marked as before, the marks clouded, not so black as ocelli; an additional patch at apex of clypeus; width 1.15 mm. Body uniform leaf green, not shining, except in the creases of the annulets; feet clear, no marks; color paler, clearer greenish yellow than before, tracheæ very distinct, white; annulets very obscure; anal prongs with a very faint blackish shade, a few setæ on anal plate.

Cocoon.—At first pale yellow, latter brown, opaque.

Food-plant.—Willow (*Salix*). Found in Central Park, New York, and Plattsburgh, N. Y. I am not certain that I have observed all the stages, but give them as they are in my notes.

Nematus pinguidorsum n. sp.

Third (?) stage.—Eating a hole in the leaf; all green, with marks as in the next stage, but faint; eye black; width of head 1.0 mm.

Fourth stage.—Head greenish, eye black, shining, a dark shade bordering the median suture and a brown one from the ocellus upward; width 1.3 mm. Body translucent, of the color of a solution of chlorophyl; segments 4-annulate, with indications of dusky tubercles on second and third annulets, segmental incisures folded. On each side of the dorsal vessel is a segmentary patch of pale yellow consisting of a collection of fat granules, showing by transparency, present on joints 5–12. Feet on joints 6–11; on the anal plate are two short, brown-tipped projections.

Fifth stage.—As before, the fat-patches very evident, pale yellow, consolidated into distinct spots; end of joint 13 above and below deep reddish; width of head 1.75 mm.

Food-plant.—White birch (*Betula papyrifera*). The larvæ are solitary and rest on the edge of the leaf. Found at Keene Valley, New York.

I do not know the true number of stages of this species.

Nematus dorsivittatus Cresson.

Egg.—Laid in semicircular incisions under the upper epidermis, 1.5 mm. long.

Second stage.—Head testaceous, a brownish shade up from the black eye; width .65 mm. Body pale yellowish, the food showing green by transparency, slightly shining, subannulate.

Third stage.—Head as in the next stage, but pale testaceous; jaws black; width 1.0 mm. Body the same, slightly shining, subannulate.

Fourth stage.—Head greenish, with a slight honey tinge, large, higher than the dorsum; a faint blackish shade runs up not far from the black ocellus which is surrounded by a black spot; mouth brown, a dark mark for antenna; width 1.4 mm. Body subtranslucent poplar-leaf green, not shining, the segments folded; no annulets, or the merest trace. Feet on joints 6–11, 13: anal prongs short, brownish; blackish marks at the base of the clear thoracic feet; tracheal line evident; no tubercles.

Fifth stage.—The same, with same width of head.

Both sexes were sent to Mr. Marlatt and determined as above. Is our species really the same as the Nevada one?

Solitary edge-eaters on poplar at Plattsburgh, N. Y.

The female fly is entirely green, except for the black marks and the legs, which are greenish testaceous.

Nematus luteotergum Norton.

Larva.—Head shining black, sutures of mouth pale; width .85 mm. Feet on joints 6–11 and 13; anal prongs black. Body shining green, yellowish subventrally and on the legs; segments obscurely annulate, all minutely pilose, but no distinct tubercles; a blackish subdorsal shade-band and also blackish on the two parts of the subventral ridge. Thoracic feet and anal plate shaded with dusky black; a medio-ventral series of black patches.

Last stage.—Head shining dark vinous, eye black; minutely pilose; width 1.1 mm. Body shining, sordid greenish, rather dark, shaded more or less with vinous, especially subventrally; segments obscurely annulate, minutely pilose; dorsal vessel a dark band; the subventral ridges show as blackish elevations. Thoracic feet partly, anal plate and prongs largely black.

A female from hybernating pupa was named "*Ammauronematus luteotergum*" by Mr. Marlatt; a pair, male and female, from the same batch of larvæ, but which emerged during the same season, were designated "*Pteronus* n. sp., near *latifasciatus* Cress." This must be simply a case of seasonal dimorphism.

Gregarious edge-eaters on alder (*Alnus*), Keene Valley, N. Y.

Nematus latifasciatus Cresson.

Larva.—Head vinous brown, dotted with brown over the vertex, eye black; width 1.6 mm. Body purplish vinous tinted, a metallic red-green shade over the dorsum, partly produced by the food showing by transparency; segments indistinctly 6-annulate, shining, a lateral black shade band, scarcely noticeable against the metallic shade, supplemented by black patches on the folds around the spiracles, subventrally and on the bases of the legs, the latter distinct against the pale purplish subventral color. Feet all pale, yellowish tinged; abdominal on joints 6–11, 13, small; anal plate and short prongs black; setaæ minute, seen with a lens.

Allied to the preceding; solitary or partly gregarious on white birch (*B. papyrifera*) at Keene Valley, New York. Imago the same season.

Nematus ventralis Say.

Eggs (see "Insect Life," i, 36).—In large clusters of flat, semicircular saw-cuts under the lower epidermis, 1 x 2 mm. in size.

First stage.—Head round, shining black; width 0.55 mm. Thoracic feet long, spreading, black except at the joints; segments indistinctly 4-annulate, abdominal feet small, on joints 6–11, 13. Body slightly shining, blackish green, subtranslucent; anal prongs concolorous.

Second stage.—As before. Head .75 mm. wide. Body smooth, greenish black, anal prongs black.

Third stage.—Head shining greenish black; width 1.0 mm.; eyes and jaws black. Body scarcely annulate, smooth, shining, obscure blackish olive, anal fork black tipped. Thoracic feet blackish, marked with black. Body unicolorous, immaculate, or the orange spots of the next stage partly present (another brood).

Fourth stage.—Head shining black, the front with four grooves and two dents above the clypeus; sutures around the mouth brown; width 1.4 mm. Thoracic feet large, pale olive, marked with black; abdominal ones small, on joints 6-11, 13, pale green. Body smooth, irregularly 5-annulate, the creases like slight folds; shining blackish olivaceous, with a series of lateral pale orange spots, distinct only centrally. The spots are above the subventral fold on annulets 2 and 3.

Larvæ vary in shade, some are blacker than others, and the orange spots vary in distinctness. The larvæ scratch the leaf with their anal prongs and make a rasping sound.

Fifth stage.—Width of head 1.4-1.6 mm. As before, slaty black, except the feet; lateral orange patches on joints 3-12; the two median annulets have somewhat corneous, dorsal, transverse areas, shining, but concolorous with body. Feet all pale watery. Two days after molting the larvæ began to turn shining and livid with a pale dorsal streak anteriorly and entered the ground to spin their cocoons.

Food-plants.—Found on willow (*Salix babylonica*) in Central Park, New York, and on poplar (*Populus grandidentatus*) at Plattsburgh, N. Y. [The latter produced *lombardus.*]

The characteristic larva of this species has been described in Harris' "Entomological Correspondence," p. 270, and in "Insect Life," i, p. 33, and quoted in the "Fifth Report U. S. Ent. Commission," pp. 524 and 588.

Male flies emerging the same season were determined by Mr. Marlatt as *N. ventralis*, but male from pupæ which had hibernated were named "*Pteronus lombardus* Marlatt MS." I have not as yet bred any females, and suggest the seasonally dimorphic relation of these two forms by showing the apparent identity of the larvæ.

Nematus Marlattii n. sp.

Larva.—Solitary, eating on the edge of alder leaves; sitting on the edge or in a hole, the posterior half of the body curled spirally. Head full at vertex, round, clypeus rounded, distinct; pale, shining, greenish brown, with a clouded, deep black longitudinal patch at the vertex and one laterally over the black eye; clypeus and mouth rather darker brown; width 1.2 mm. Thoracic feet moderate, pale; abdominal ones on joints 6-11, 13; segments moderately 4-annulate, smooth, not shining, subtranslucent leaf-green, dorsal vessel scarcely showing; a broad subdorsal blackish green band, broken into a series of segmental patches, extending down to enclose the spiracles; double subventral ridge also blackish, but distinctly spotted with pale, corresponding to the obsolete tubercles; the subdorsal patches also contain pale spots corresponding to tubercles on annulets 2 and 3, but less distinctly.

Imago.—Length 25 inch., expanse .5 inch.; antennæ nearly three-fourths the length of body. The coloration corresponds with Norton's description of *ventralis*, but the orbits are continuously pale.

A single female was determined by Mr. Marlatt as *N. ventralis* Say, and indeed corresponds closely with the description. However, as the larva is very different, the species must be separate.

Nematus Hudsonii magnus n. sp.

Larva.—Sitting on the edge of a leaf and thrashing the abdomen about when disturbed. Head normal, round, black, sutures paler; width 2.2 mm. Thoracic feet moderate, pale, abdominal ones on joints 6–11, 13, well developed; short black anal spines. Body smooth, shining, faintly 3-annulate, dorsal vessel yellowish; color bluish or leaf-green, with a series of orange-yellow, large lateral blotches on joints 3–12 and numerous black spots as follows: two transverse rows per segment above the spiracles, the anterior of three on each side, the posterior of four, its lower (lateral) one largest; two black patches on the halves of the subventral ridge, the lower posterior one somewhat broken; on joint 13 a large lateral black patch and dorsal suranal blackish cloud.

Imago.—Female: length 9.5 mm. Black, lateral lobes of mesothorax dark brown. Abdomen yellowish ferruginous, except basal plates and extreme tip. Wings hyaline, a faint dusky shading below stigma; posterior angles, labrum and palpi, tegulæ and legs pale, coxæ black at base, posterior coxæ and all the femora largely yellowish ferruginous, apical three-fourths of posterior tibiæ and their tarsi black.

Mr. Marlatt has confirmed my determination that this species is undescribed.

Two larvæ on poplar at Plattsburgh, N. Y.

This rather large fly is named for my friend, Prof. George H. Hudson.

Nematus corylus Cresson.*

Third stage.—As in the next stage, but less green, more sordid yellowish: all shining, subventral black spots distinct, anal plate black, contrasting, contiguous to a small spot below the anus; width of head .7 mm.

Fourth stage.—Head shining black; width 1.0 mm. Body shining green, a little paler than the upperside of the alder leaf; dorsal shading (of the next stage) scarcely indicated, except as a dusky subdorsal shade on thorax, but anal plate black; subventral folds black, forming two black spots per segment, the upper anterior, the lower posterior. Thoracic feet black at base and tip; median ventral black spots present, but abdominal feet concolorous with body; not opaque, the tracheal line visible; setæ on two annulets.

Fifth stage.—Head shining brown, sordid, eye black on a diffuse spot; width 1.4 mm. Body indistinctly annulate. Feet on joints 6-11, small on 11; thoracic feet moderately large. Body long, slender, green, of a dark tint, the spiracular area on each segment faintly discolored, yellowish; dorsal area completely shaded in black, slightly metallic (bronzy); double subventral folds, abdominal feet outwardly and a row of medio-ventral dashes black; sometimes a little black stigmatal spot. Thoracic feet pale, marked with black above on joints and claw; anal plate black; setæ minute, dark.

Cocoon.—An oval brown structure at the surface of the ground, as usual in the genus.

Slender, gregarious edge-eaters on alder, with five long, slender, eversible, medio-ventral scent glands, emitting an unpleasant odor, situated posterior to the abdominal feet on joints 6–10. Found at Weld Pond, Franklin County, Maine.

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* These larvæ differ from those described by me under the same name (Can. Ent. xxvi, 44), but perhaps not to a specific degree.

Nematus lateralis Norton* (3E). *Larva.*—Head rather flat before, green, a black shade from ocellus each side nearly to vertex and narrowly in the sutures of clypeus and median suture to vertex ; ocellus in a black spot; width 1.4 mm. Body leaf-green, rather dark, slightly shining; feet on joints 6–11, 13, small, concolorous; segments rather indistinctly 5-annulate, with minute, dark, setiferous dots on two central annulets, most distinct on the thorax and subventrally. Body slightly translucent, tracheæ evident, no marks; anal feet absent, but on end of anal plate a pair of colorless short processes with enlarged ends.

Last stage.—As before, but a black shade on clypeus; segments 4-annulate, not shiny, annulets 2 and 3 higher and shiny; no setiferous dots, but minute pile on head and thorax ; blackish marks at base of thoracic feet.

Solitary edge-eaters on white birch (*B. papyrifera*), the body not elevated, but bent with the leaf. Found at Plattsburgh, N. Y., and Keene Valley, New York ; also in Central Park and along Riverside Drive, New York City, on *B. populifolia.*

NOTE.—The preceding larvæ are all adapted to rest on the edges of leaves. The two following, however, rest flat on the surface, are slightly flattened, and would be taken for species of *Selandria* at first glance. But their number of legs is normal for the Nematids.

Nematus thoracicus Harrington.

First stage.—Head round, higher than wide, but not narrowing to vertex ; shining, eye black, mouth brown; width 0.25 mm.

Second stage.—Similar; eye surrounded by a black spot: head rather higher; width 0.33 mm.

Third stage.—Head almost whitish, pale: width 0.5 mm.; joint 2 small, making the head appear prominent. Body much as in the following stages, but paler.

Fourth stage.—As in the next stage in all points, but a little paler, though darker than in the previous stage; width of head 0.7 mm.

Fifth stage.—Head round, smooth, shining, greenish testaceous, prominent; eye black, mouth brown; width 1.0 mm. Thorax a little enlarged, the feet spreading widely, not concealed. Abdomen slightly tapering posteriorly, gradually becoming smaller from the thorax; feet present on joints 6–11 and 13; segments 4-annulate, smooth, without tubercles, not shining; color pale clear green, the alimentary canal showing dark green, or the surface covered with a slight white bloom. Thoracic feet watery greenish; abdominal ones short, concolorous with the pale subventral region; anal plate rounded.

Sixth stage.—As before; width of head 1.4 mm.

Seventh stage.—Head held forward ; light testaceous, faintly brownish, smooth, shining minutely reticulated; eye black, mouth brown; width 2.0 mm.; joint 2 depressed anteriorly. All as in the previous two stages: skin smooth, but not shining; at the end of this stage the larvæ fade to a whitish color with a bright green dorsal band and enter the earth without molting.

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* Identified by Mr. Marlatt, but doubtfully. He says: "3E does not agree altogether in color with this species, but seems to come closer to it than to any other. . . . Since the original type of *lateralis* is lost, it may be as well, perhaps, to describe your specimen as a new species."

Cocoon double, the outer layer thin, brown, the inner dark brown, compact, but not very hard; size 4 x 8 mm.

Larvæ found at Woods Holl, Mass., Jefferson, N. H., and at Plattsburgh, N. Y.

Solitary, resting on the venter on the under surface of a leaf; eating only the lower epidermis and parenchyma until nearly full grown, when they eat the whole leaf for a short time. The food-plant is the sugar plum (*Amelanchier canadensis*).

Nematus unicolor Marlatt MS.* (4J). *Larva.*—Head slightly granular, shagreened, a little pilose. pale brownish, pale around mouth, not shining; eye on a black spot; two blackish shades on the back of head behind the vertex; width 1.8 mm. Thorax a little enlarged, its feet spreading; venter flattened; feet on joints 6-11 and 13; subventral region slightly fluted with a few pale setæ; segments not very completely 5- to 6-annulate, segmental incisures folded. not shining, translucent greenish, food giving a dusky tint; subdorsally below the skin a series of emerald-green or pale green granules and streaks, forming a nearly continuous band or even an evident white subdorsal band; tracheal line evident; spiracles pale. When mature the larvæ became pale yellowish with a bright emerald green tint on the thorax and entered the ground.

Cocoon as usual.

Shape and habits of the preceding. Found on the white birch at Keene Valley, New York.

Pœcilosoma inferentia Norton.

Larvæ.—Singly on alder, stretched out flat on the surface of the leaf; smooth, not shining, pale leaf-green, covered with a white bloom; segments 6-annulate. Body slightly largest through the thorax, smaller posteriorly. Thoracic feet not large, just visible from the dorsal aspect; abdominal ones on joints 6-12, 13 posteriorly. Head with a white bloom; eye surrounded by a black spot; width 1.2 mm.; length of larva 18 mm.

Last stage.—No white bloom. Body smooth, slightly shining, pale green, a little yellowish and rather opaque. Head less green, eye black; gradually the larva becomes a translucent waxen pinkish and seeks a place for hibernation.

Found on the alders in Keene Valley, New York, the imagoes the following April.

The two sexes of this fly are very different, and the female has been described by Provancher as *Strongylogaster albosecta.*

Monophadnus barda Say. *Larva.*—Head black throughout, not very shiny, smooth; width 1.6 mm. Feet on joints 6-13; body thick, sides perpendicular; no ridge; segments 6-annulate, the annulets less distinct than the segmental incisures, smooth, slightly shining; color opaque whitish, with a leaden gray tinge. Thorax, subventral region to spiracles and joint 13 faintly shaded with pale yellow; tracheal line evident; a layer of gray-white pigment seems to lie under the skin like a blanket over the dorsal area nearly down to the spiracles.

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* Mr. Marlatt identifies the fly bred from this larva with specimens from Mt. Hood. Oregon, to which he has given the MS. name of *Pteronus unicolor.*

Last stage.—Not observed; the larva molted and immediately entered the earth.

Found on a young leaf of ash (*Fraxinus*) at Keene Valley, N. Y.; also on the ash at Rouse's Point, N. Y., in June.

Taxonus multicolor Norton. *Larva.*—Head with a gray lateral patch and one at the vertex, shining; width 1 mm. Thorax a little enlarged, feet on joints 6–13; segments neatly 6-annulate, not at all shiny; color all sordid white with faint traces of a shaded black subdorsal line; food showing faintly by transparency.

Next stage.—Head pale brownish, a large square black patch on the vertex, not reaching the clypeus: a lateral patch; mouth brown; head scarcely shining; width 1.4 mm. Body not shining, with a smoky tinge, a very broad olivaceous black subdorsal band, irregular above; faint blackish marks in impressed spots above the subventral fold. Feet all pale; anal plate transverse, black, not shining; two little pale dots on annulet 1 of joint 2; a brown shade at apex of clypeus.

Last stage.—Width of head the same; translucent and waxy throughout, tinged with vinous and tar-brown, the latter in the folds and on vertex of head. Body shining, smooth, annulate. On acquiring this stage the larvæ enter the ground to construct their hibernation cells.

Sitting flat on the venter on the leaves of the white birch (*Betula papyrifera*); also on the yellow birch (*B. lenta*).

Hylotoma scapularis Klug.

Entirely similar to and indistinguishable from the larva of *H. pectoralis* Leach, which I have elsewhere described. Feeds on the white birch.

Hylotoma cæruleus Norton.

Also indistinguishable from the larva of *H. pectoralis.* Feeds on white birch.

Hylotoma McLeayi Leach (2L). *Larva.*—Head pale greenish yellow, eye and mouth black; a dusky black stripe over vertex and upper part of clypeus; width 1.8 mm. Thoracic feet large, abdominal small, on joints 6–11, 13. Body segments 3-annulate, the obscure shining tubercles greenish, tubercle 1 marked with black on joints 2–4; subventral ridge very prominent, undulate setiferous: color light green, darker dorsally, with a broad, distinct, pale yellow subdorsal band between tubercles 1 and 2; spiracles black, subventral ridge faintly discolored, brownish; all tubercles setiferous; line of tracheæ yellowish.

Cocoon reticular, of yellow silk, at the surface of the ground, as usual in the genus.

Found on black birch at Plattsburgh, and on white birch and mountain ash at Keene Valley, N. Y.; also on *Pyrus arbutifolia* at

Woods Holl, Mass., and on sugar plum (*Amelanchier*), willow and strawberry at Jefferson, N. H.

It will be noted that this larva is widely different from the one described by Norton as *H. McLeayi*, and also from the one which I have recently described under the same name in the "Canadian Entomologist." The latter larva is marked by the letter S in my notes, the present one by 2L. The flies were sent to Mr. Marlatt, who confirms my determination saying "your specimens labeled S and 2L are unquestionably *McLeayi*."

Apparently, in this genus, there are three species produced from one larva (*pectoralis*, *scapularis* and *cœruleus*) and three larvæ which produce one species of imago (*McLeayi*).

I want to call attention to this curious problem in order to induce others to assist in investigating it. I may state that the larvæ which produced *McLeayi* were bred in different years, so that it is highly improbable that there could have been any confusion. Moreover, they were fed in small jars on single leaves, so that other larvæ could not have been accidentally introduced without discovery.

Strongylogaster soriculatus Provancher. *Larva.*—Head whitish, with sordid testaceous tinge, shining, eye black, mouth brown; some with an obscure brownish shade at vertex, or a black patch behind eye and a large one on vertex. Body not shining, whitish waxy, appearing green, except subventrally, from the food showing by transparency; in later stages actually green; segments finely 6–7 annulate; spiracles dark, tracheal line white; feet on joints 6–13.

Found on the common brake (*Pteris aquilina*) solitary, sitting flat on the venter, or on the edge of a leaf. Pupa form in a cell bored in soft wood.

***Strongylogaster annulosus** Norton.

Not distinguished from the preceding and occurring on the same food-plant. Some of the variations above noted and referred to individual differences are probably really of specific value.

***Strongylogaster luctuosus** Provancher.—Head shining whitish with a brown tint, eye and mouth dark; a black shade behind the eye, touching it; a neat, shining, black patch on the vertex, pointed anteriorly and reaching the clypeus, where it enlarges a little; width 2.4 mm. Body neatly annulate, light emerald-green dorsally, waxy whitish on joint 2 anteriorly, joint 13, subventrally and on the feet; last two joints of spreading thoracic feet black tipped; a pair of black patches at base of anal plate, and a series of little orange ones below the black spiracles on joints 3–12. Body slightly shining.

Found with the preceding at Keene Valley, N. Y.; also on *Pteris* at Jefferson Highlands, N. H.

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* Determined by Mr. A. D. MacGillivray.

***Strongylogaster pinguis** Norton.

Egg.—Laid in nearly circular saw-cuts under the upper epidermis in the middle of the leaf.

First stage?—Head as in the next stage, but the clypeus entirely black; width .35 mm. (probably an error; .5 is the calculated width), smooth, annulate, the points on joint 2 indicated; subventral region a little scalloped; color pale greenish, food giving a darker shade.

Second stage?—Head conical, high, the apex curiously pointed, blackish brown, pale below; eye black; width .6 mm. (= .7?). Thorax a little enlarged, subventral region protruding, fluted, applied close to the leaf; segments obscurely annulate; feet on joints 6–13; pale green, with an olivaceous tinge, not shining, the whole dorsal region blackish, defined at the lateral edge: a pair of colorless elevated flaps in place of the cervical shield; small black anal points.

Third stage.—Head conical, round-pointed at the apex, sutures indistinct; mahogany red, pale around the mouth; ocellus black; width 1.1 mm. (= 1.0 mm.?). Two conical processes on the first annulet of joint 2 and a single median one just behind them on the third annulet of 2. On joint 13 a small subdorsal point and four such on the edge of the segment posterierly; subventral folds fluted, with pointed concolorous tubercles; segments obscurely 7-annulate with indications of pointed tubercles subdorsally; color not shining, yellowish olivaceous from the food showing through the pale yellowish body; a defined black lateral line, beginning on joint 2 behind the points and ending on joint 13 behind the points there.

Fourth stage.—Head 1.4 mm.; segments 6-annulate; subdorsal points on the second and fourth annulets and six on the subventral fold are distinct; otherwise as before.

Fifth stage.—As before; width of head 2.0 mm.; a blackish cloud at the apex of head.

Sixth stage.—Of the same shape as before, but without any tubercles, all shining sordid yellowish in color without marks. Head a shade more reddish than the body; width as before. The folds of the body have a tarry-brown shade. In this stage the larvæ do not eat, but enter the ground to form cells for hibernation.

On the birch and linden at Keene Valley, N. Y. The larvæ sit flat on the venter on the surface of the leaf, solitary; also on the birch, sugar plum and maple at Jefferson, Highlands, N. H.

These curious larvæ are very unlike most *Strongylogaster* larvæ.

Strongylogaster abnormis Provancher. *Larva.*—Head whitish, upper half gray, except posteriorly; a brown band over the clypeus between the eyes; eye in a black spot; width 1.2 mm. Body segments 6-annulate, smooth, not shining; dorsal area above spiracle, except on joint 13, leaf-green; a dorsal and lateral gray shade, the latter bounding the green area, often faint or absent; subventral region and venter whitish; joint 13 dorsally pale green, contrasting. Thoracic feet moderately large, pale; abdominal ones on joints 6–13; antennæ distinct below eye, pale; minute white points are situated on the second and fourth annulets, one in the anterior row and two in the posterior above the stigmatal line, then two points below it and smaller ones on the substigmatal folds.

Last stage.—Head shining, pale, the upper half and clypeus brown, the marks cut in a reticulate manner with fine pale lines. Body shining, without points, 6-annulate, green to the spiracles, waxy greenish below, marked with tar-brown in the folds; spiracles black. Thoracic feet clear; eye on a black spot. On attaining this stage the larvæ bored in soft wood to pupate.

Sitting flat on the venter or curled spirally on the back of a leaf of the dock (*Rumex*).

Common along West End Avenue, New York City, in the vicinity of unoccupied building lots.

Strongylogaster apicalis Say. *Larva.*—Head large, shining, ocherous, a little brownish on vertex and clypeus; eye in a black spot; jaws black; width 2.2 mm. Feet moderate, abdominal ones the larger, present on joints 6-13; dorsal region not shining, greenish, with a little trace of white bloom, ending in a lateral smoky black line more or less distinct; below this line the venter and legs honey-yellow, a little suffused by white bloom, immaculate, or with dusky black dots on the subventral folds; segments indistinctly 6-annulate, the folds showing as whitish creases. Larva rolls up in a ball and falls off the leaf at the slightest provocation.

Last stage (hibernation).—Shining, annulate, green above, whitish below, with a trace of gray marking laterally at the joining of the colors. Head as before. The larva passes the Winter in a cell in the ground.

Food-plant.—Raspberry (*Rubus*).

Tenthredo Cressoni Kirby. *Larva.*—Head very pale, slightly testaceous, shining, a brown ocherous shade at vertex, cut (under a lens) by three pale lines, the middle one representing the suture; width 2.4 mm.; segments 4–6 annulate, on second and fourth (or first and third) annulets some very minute white points, two on annulet 2, five on annulet 4, the last substigmatal, and another substigmatal on annulet 3; none on the subventral folds. Body not shining, whitish, with a green tinge, varying to pale yellowish green, quite translucent; a shaded subdorsal yellowish band, composed of fat granules lying under the skin, distributed in all the annulets; food not showing greatly, dark; claws of the thoracic feet brown; abdominal feet on joints 6–13. Thorax somewhat enlarged.

Last stage.—Smooth, shining light green, annulate, no tubercles; a row of small, dark, segmentary subdorsal patches; otherwise as before. The larvæ enter the ground and form a cell for hibernation.

Found on the white birch at Keene Valley, sitting on the leaves, curled spirally. Easily drops off if disturbed. The same larva occurred on white birch at the upper limit of its growth below the summit of Mt. Washington, N. H. (about two and a half miles down the carriage road).

Mr. MacGillivray remarks: The specimen does not agree perfectly with Kirby's description, yet it does not seem to depart far enough to consider it a distinct species.